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No. I.

TRITOXA FLEXA WIED., THE BLACK ONION FLY (ORTALIDAE, DIPT.).

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The black onion fly was observed as an enemy of onions as early as 1865, but no positive published records of similar injuries were brought to the writer's knowledge until more recent years. This fly is a native species, and although recorded as occurring in New Jersey, it has not attracted attention save in the States of Ohio, Illinois, Indiana, Pennsylvania, Wisconsin, and Minnesota, and there are, therefore, reasons for believing that it is practically restricted, at least as a pest, to the middle western region and does not extend very far east or south of the states mentioned.

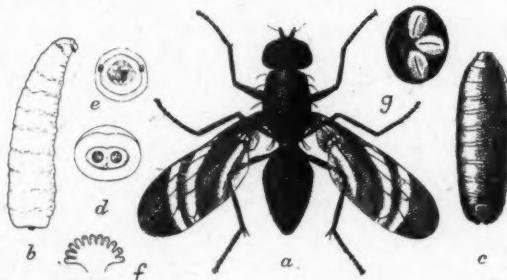


Fig. 1—Black onion fly (*Tritoxa flexa*): *a*, fly; *b*, larva; *c*, puparium, ventral view; *d*, anal extremity from below; *e*, cephalic extremity, face view; *f*, cephalic spiracle; *g*, posterior spiracle.

This fly (fig. 1, *a*) belongs to the Ortalidae, a different family from the common root-maggots, or Anthomyiidae. It is almost entirely black or fuscous with the exception of three narrow, oblique, hyaline white fasciae or bands on each wing. The two outer fasciae are moderately curved and the one nearest the body is more nearly straight and usually wider. The body is slender, the abdomen considerably depressed (in death); the legs are rather slender and long and the head and eyes somewhat prominent. The total length is about one-third of an inch (8.5 mm.) and the wing measures about one-fourth of an inch (5.5 mm.). A detailed specific description of the fly is given by Loew (4).²

The larva or maggot (fig. 1, *b*) is shining pale yellowish or yellowish white and of elongate cylindrical form, measuring seven or eight times as long as wide. There are eleven segments in addition to the small, retractile head. The anterior third of the body narrows strongly to the head and the posterior two-thirds are of equal diameter. The head is very small, truncate and not prominent, and the mandibles are microscopic, slender and hook-like, black, and bent downward toward the venter. The thoracic (cephalic) spiracles are brown, small but prominent, projecting strongly from the side as shown in figure 1, *e*. They are

²—The numbers in parentheses refer to "Literature Cited" on last page.

composed each of 11 short, fleshy tubercles (fig. 1, *f*). The anal segment is narrowed from the posterior third and rounded, and is squarely truncate at the apex, where there are two prominent blackish tubercles. Obliquely above each posterior spiracle are two tubercles, with one large one obliquely below. Sometimes one or two small tubercles appear on the lateral edge between the above mentioned tubercles.

Banks (1) describes and figures the stigmal plates on low elevations, about their own diameter apart, each with three radiated slits and an incomplete button on the inner side (see fig. 1, *g*).

The length when fully matured (in well preserved alcoholic material) is $\frac{2}{5}$ of an inch (10-11 mm.) or a little longer, and the greatest diameter is about $\frac{1}{16}$ of an inch (1.5 mm.). The figured larva is considerably contracted.

The larva sufficiently resembles the two common onion-feeding maggots, the onion maggot (*Hylemyia antiqua* Meig.) and the bean fly (*H. cilicrura* Rond.), as likely to be mistaken for them unless a strong lens is used. It is longer and more slender and may readily be distinguished by the anal extremity being squarely, instead of obliquely, truncate and by lacking the fringe of marginal tubercles, so prominent in the species of *Hylemyia*.

The puparium or pupa (fig. 1, *c*) is of shorter cylindrical form, the length being about three times that of the diameter. The color is dark reddish brown and darker at each end. At the cephalic extremity there is a little projecting process on each side; the anal extremity shows a dark transverse oval process strongly and longitudinally impressed at the middle. The apex is truncate and presents much of the appearance of this portion in the larva. It is shown in figure 1, *d*. The length is about $\frac{1}{4}$ inch (6-7 mm.) and the diameter is about $\frac{1}{12}$ inch (2 mm.).

The puparium is separable from those of *Hylemyia* found on onion by practically the same characters as the larva, the greater length and squarely truncate and unarmed anal segment and especially the posterior spiracle (fig. 1, *g*).

The approximate distribution, as far as known, includes definite localities in New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin and Minnesota, and indefinite localities in Connecticut and Georgia. It is quite probable that the species occurs also in New York, Delaware, West Virginia, Kentucky, Michigan, and Iowa.

The black onion fly was given its first scientific name by Wiedemann in 1830, when it was described as *Trypetta flexa* (8); subsequently it was redescribed by Walker as *Trypetta arcuata* (6), and still later the species was removed to the genus *Ortalidis*. The biologic literature is scant. The first account of injuries which appears to have been published is that by Dr. Henry Shimer in "The Prairie Farmer" in 1865 (5). This is a short notice and has reference to destruction to the onion in the neighborhood of Mount Carroll, Illinois. The substance of Dr. Shimer's communication (5) is as follows:

"In the latter part of June, I first observed the larva or maggot among the onions here. The top dead, tuber rotten, and the maggots in the decayed substance. From them I bred the fly. They passed about two weeks in the pupa state. At that time I first observed the flies in the garden, and now a few are to be found. Their favorite roosting place is a row of asparagus running along

the onion ground, where they are easily captured and destroyed from daylight to sunrise, while it is cool and wet. During the day they are scattered over the ground and on the leaves and stalks of the onions, and not easily captured. Their wings point obliquely backward, outwards and upwards, with an irregular jerking, fanlike movement; flight not very rapid or prolonged. They are not very numerous, probably not over 200 or 300. All that I observed originated in one part of the bed, where they were doubtless deposited by one parent fly."

Mr. Levi Bartlett, of New Hampshire, published the same year (2). It appears that this species had been so injurious to the onion in sections of New Hampshire for a number of years that its cultivation had been nearly abandoned. Reference was made by Walsh (7) that there was printed in the New York Tribune some years previously a letter from Dr. O. W. Drew, Waterbury, Vermont, in which it was stated that for many years the onion crop had been entirely destroyed in central Vermont by the onion maggot.³

Brief notices were afterward published by Walsh in 1867, Packard in 1869, Riley in 1870, Glover in 1874, and Washburn in 1906.⁴

In 1913 the writer (8) published a somewhat comprehensive, popular economic account, and at about the same time Banks (1) published a description and a figure of the larva.

UNPUBLISHED REPORTS OF INJURY.

April 3, 1901, Mr. J. F. Nann, Cincinnati, Ohio, reported that the maggots were attacking chives (cives) in that vicinity.

September 26, 1904, Mr. J. O. Villars, Williamson School, Pa., wrote that flies were found in a pantry. It being suggested that their presence might be due to their having bred from onions, our correspondent promptly forwarded an entire basketful of infested onions from the pantry. When received the insects were in three stages—larva, pupa, and adult. At least 90 per cent of the onions were dry and most of them had been completely hollowed out and were reduced to mere shells. Larvae continued living up to October 15. Writing later of this infestation, Mr. Villars stated that the onions appeared to be intact when pulled about July 20, and that the flies began to issue about September 1. Fully half the onions stored had been completely destroyed, with nothing left but the dry husks.

During 1906, Dr. S. A. Forbes reported the species on June 15 as attacking onions in Cook County, Illinois. September 4, Mr. A. G. Ruggles, St. Anthony Park, Minn., reported this fly in a jar in which were many imported onion maggots.

During 1921 this species was the subject of correspondence with Mr. H. K. Laramore in its occurrence on onions in store at Knox, Ind., in October, considerable and extensive damage being reported and a remedy urgently requested.

Naturally in the case of a plant like onion, after decay sets in, numerous other flies are attracted. The list of observed species includes *Muscina stabulans* Fall, *Sciara inconstans* Fitch, *Phora nigriceps* Loew and *Drosophila punctulata* Loew.

³—It is by no means certain, in fact it is improbable, that injury in Vermont and New Hampshire was due to the ravages of the larva of *Tritoxa flexa*. It is more likely that the imported onion maggot was the author of the mischief.

⁴—Not cited.

LITERATURE CITED.

- (1)—BANKS, Nathan—Tech. Series, No. 22, Bur. Entom., U. S. Dept. Agri., pp. 34, 35, pl. III, figs. 44-46, Jan. 10, 1912.
- (2)—BARTLETT, LEVI—Practical Entomologist, voi. I, p. 20, 1865.
- (3)—CHITTENDEN, F. H.—U. S. Dept. Agric. Yearbook, 1912, p. 329, 1913.
- (4)—LOEW, H.—Monographs of the Diptera of North America, Pt. III, pp. 102-104, pl. VIII, fig. 10, 1872.
- (5)—SHIMER, H.—Prairie Farmer, Sept. 2, 1865.
- (6)—WALKER, F.—Insecta Saundersiana, Diptera, p. 383, pl. VIII, fig. 10, 1856.
- (7)—WALSH, B. D.—Practical Entomologist, vol. I, p. 4, fig. 1865.
- (8)—WIEDEMANN, C. R. W.—Aussereuropäische Zweiflügelige Insekten, vol. II, p. 483, 1830.

NOTES AND NEW SPECIES (LEPID.).

BY WM. BARNES & F. H. BENJAMIN,

Decatur, Illinois.

***Hyloicus luscitiosa* race *bombax* nov.**

Similar to eastern *luscitiosa*, both fore and hind wings considerably paler, the usual sagittate black dashes on the fore wing only about half normal size.

The present form is almost undoubtedly a western race of *luscitiosa*, a parallel to *H. gordius oslari* R. & J.

Holotype.—♀, Provo, Utah (Tom Spalding) and pupal skin from which it emerged, V-14-19, unique.

***Triphaena oblata* race *streckeri* nov.**

Differs from typical *oblata* by the greatly flattened, elongate, orbicular.

Holotype.—♂, Tuolumne Meadows, Tuolumne Co., 1-7 July.

Allotype.—♀, Plumas Co., no date.

Paratypes.—3 ♂, Deer Park Springs, Lake Tahoe, 1-7 July, Shasta Retreat, Siskiyou Co., 24-30 Aug., and "California," no date; 3 ♀, Shasta Retreat, Siskiyou Co., 1-7 July; "Cal." no date; "California," no date.

Notes: Types in Barnes Collection, except 1 ♂ 1 ♀ Paratype deposited in the Field Museum. Besides the types, we possess three very old specimens labelled "Calgary, N.W. Ter.," "Col. Jacob Doll," two of these being intermediate to typical *oblata*. Alberta specimens before us, a series from Calgary (Dod) and Nordegg (McDunnough) seem to be typical *oblata*.

***Caradrina nigra* race *argni* nov.**

Considerably paler than *nigra*, the black ground color grayer, the sordid tints of the typical form practically lacking. True *nigra* varies from deep carboniferous black to forms mottled with sordid brown. Not a single example in ninety five specimens before the authors approaches *argni*.

Holotype.—♂, Tuolumne Meadows, Tuolumne Co., Calif., unique.

***Chabuata signata* form *igna* nov.**

Similar to typical *signata* but without white in the reniform, which is practically concolorous with the ground color.

Holotype.—♂, New Brighton, Pa., 17-Aug. 1903 (H. D. Merrick).

Allotype.—♀, White Mills, Pa., "VIII-15."

Paratypes.—7 ♂, New Brighton, Pa., 16 Aug. 1906 (1), Decatur, Ill., 24-31 July (2), id. 16-23 Aug. (1), id., no date (1), Sulphur City, Washington Co., Ark., 8-15 Aug. (1), id., 16-23 Aug. (1); 2 ♀, Decatur, Ill., 8-15 Aug. (1), Sulphur City, Washington Co., Ark., 24-30 Aug. (1).

Notes: types in Collection Barnes; Paratype in Field Museum.

Chabuata signata race **semitropicae** nov.

Similar to typical *signata* but deep purple in color; lacking the usual brown tints of the typical form. A long series of *signata* from Md. to Pa. and west to Man., Colo and Ark. show no strong purple tints, although variable as to the intensity and shade of brown.

Holotype.—♂, St. Petersburg, Fla., 15 Oct. 1914 (R. Ludwig).

Allotype.—♀, 24-30 Oct.; in Collection Barnes.

Chabuata notata form **ota** nov.

Similar to typical *notata* but of a beautiful rich purple color, thus superficially appearing distinct; and bearing a close resemblance to *C. signata semi-tropicae*.

Holotype.—♂, Dickinson Co., Iowa, 27 Aug. 1915, Collection Barnes.

Eriopyga daviesi sp. nov.¹

♂: antennae bipectinate. Head and thorax brown to gray, more or less marked by black, some of the scales more or less pale tipped. Fore wing: ground color dull brown, irrorated and suffused with black which nearly obscures the true ground color in some individuals; all markings more or less distinct; basal line double, black, waved from costa to inner margin; t.a. line double, black, outwardly oblique from costa, interrupted on radius, but generally outwardly oblique to the base of the small, black-outlined claviform, thence inwardly produced to vein 1, thence as an excurred crescent to inner margin; orbicular distinct, irregular black-outlined, its center irrorated with fuscous; reniform distinct, centrally constricted, black-outlined, with a central fuscous crescent; veins marked with black; t.p. line with a tendency to be double, black, produced to points on the veins, erect on costa, strongly excurred around cell, incurved below vein 4; s.t. line pale, luteous, more or less irregular, inwardly oblique from costa to about vein 7, interrupted, thence in general nearly parallel to the outer margin, defined in the s.t. space by strong black dashes and shades, individually variable in intensity; a narrow black terminal line; fringe luteous at base, interlined darker, outwardly fuscous, checkered by the luteous base extending through and breaking the interline into spots. Hind wing: whitish, irrorated with fuscous, especially distally, a discal spot showing through from underside, veins dark. Beneath: whitish, irrorated and suffused with fuscous; common line more or less obsolescent; discal dot obsolescent on fore wing, present on hind wing; fringes as on upper side.

♀: antennae simple, ciliated. Hind wing darker and more evenly suffused with fuscous than in the male. Otherwise similar.

Expanse: ♂, 25-31 mm.; ♀ 27-33 mm.

Similar to *curtica* Sm.; antennae of male with the shaft less heavy but the pectinations longer and more nearly of equal length on both sides of the shaft; in general much less heavily built, smaller in size, the color darker, grayer, and not red. Probably elsewhere determined as *akalus* Stkr.

Holotype.—♂, Fort Wingate, N. Mex. 16-23 July.

¹Named in honor of Dr. Davies, Director of the Field Museum.

Allotype.—♀, 1-7 July.

Paratypes.—13♂, 12♀, 24 May to 31 July.

Notes: types in Barnes Collection; Paratypes in U.S.N.M. Canadian National Collection and Field Museum.

***Eriopyga eureka* sp. nov.**

♂: Antennae bipectinate. Head and thorax brown to gray, more or less marked by black, the scales often pale tipped. Fore wing: ground color dull gray-brown, irrorated and suffused with black; all markings more or less obsolete; basal line, t.a. line, basal dash, claviform and orbicular obsolete; veins with some black scaling especially noticeable on veins 2, 3, 4, beyond cell and mesad of the s.t. line; at the end of the cell an obsolescent reniform, kidney-shaped, its basal part suffused with a black blotch at the junction of veins 3, 4, with cell; t.p. line only faintly indicated as short black dashes on the veins, in general outcurved from costa and incurved below vein 5, its exact course indeterminate; s.t. line obsolescent, pale, luteous, inwardly oblique from costa to vein 7, interrupted, from vein 7 slightly waved, in general its course nearly parallel to outer margin; more or less of a row of black dashes between the veins, mesad of, and defining, the s.t. line; a thin black outer line; fringe luteous at base, interlined darker, and presenting a more or less appearance of being both striated and checkered because of possessing luteous and fuscous interlines which are interrupted by luteous and fuscous checkers. Hind wing: whitish, more or less suffused and irrorated with fuscous; strongest distally, and on the veins which are thereby darkened; fringe luteous at base, interlined darker, pale tipped.

Beneath: pale, suffused and irrorated with rufous-brown and black; a common line, obsolescent on the hind wing; discal spot of fore wing obsolete; of hind wing, obsolescent; fringes as on upper side.

♀: antennae simple, ciliated. Hind wing more generally suffused with fuscous than in the male, presenting an almost uniformly dark appearance. Otherwise, sexes similar.

Expanse: ♂, 25-31 mm.; ♀, 27-30 mm.

Belongs to the *curtica-akalus* group. Antennae of male less heavily pectinated than in *curtica* and *utahensis* but more heavily pectinated than in *rufula*, which latter Hampson appears to consider heavily serrate.

Holotype.—♂, Eureka, Utah, VIII-20-20.

Allotype.—♀, id., VIII-21-11.

Paratypes, 11♂, 25♀, Eureka, Utah, Aug. and Sept.; 1♂, Deer Creek, Provo Canon, Utah, VII-22-13; 1♂ Stockton, Utah, IX-1-06; 1♀, Provo, Utah, no date; all from Tom Spalding; 1♂, Pine Valley Mts., Utah, 6000 ft., IX-17-23, George P. Engelhardt.

Notes: types in Barnes Collection; paratypes in U.S.N.M., Canadian National Collection, Brooklyn Institute, and Field Museum.

***Copicucullia antipoda* race *adopitna* nov.**

? \ddagger *antipoda* Auct. nec Skr.

1912, Barnes & McDunnough, Contr. N.H. Lep. N.A., I, (4), 7, pl. 11, f. 13. *Copicucullia*.

Copicucullia antipoda and *propinqua* have heretofore been regarded as distinct species. The types represent the same form, while the form usually going as *antipoda* was unnamed. A series of about two hundred specimens indicates

that the paler form is the result of desert environment. Colorado produces, in general the darker form; Eureka, Vineyard and Provo, Utah produce forms varying from a white to a slate gray ground color. The desert in the vicinity of Callao, Utah seems to produce the paler form, as does Inyo Co., Calif.

It is to this pale desert form, usually called *antipoda* that we apply the anagram name *adopitna*.

The figure of Barnes and McDunnough was made from a female, not in the best of condition but probably represents a rather rubbed and suffused specimen of *adopitna*.

To avoid any chance of a mixed type series we are restricting our types.

Holotype.—♂, Olancha, Inyo Co., Calif., 24-30 June.

Allotype.—♀, 8-15 June.

Paratypes.—9♂ 4♀ 8-15 May to 24-30 June.

Notes: Types in Barnes Collection; ♂ ♀ Paratype Collection Field Museum.

Graptolitha ricardi sp. nov.

Size and general habitus of *semiusta*, and of the same peculiar brownish-red shade powdered with black; smoother looking; ordinary lines, except the s.t., poorly defined, the latter mainly indicated by a preceding pale shade; orbicular as a large round spot of the ground color contrastingly defined by a surrounding pale line; reniform roughly figure 8 shaped with the lower half filled with black scales, the upper half filled with ground color, the whole spot defined like the orbicular; claviform obsolescent, not followed by a blackish bar. Hind wing similar to *semiusta*, but somewhat darker. Beneath: disc of primaries rather heavily black powdered, hind wing with black discal dot.

Holotype.—♀, Hereford, Ariz., no date, C. R. Biederman.

Eumichtis gunderi sp. nov.²

Intermediate between *versuta* and *loda*, completely lacking any of the brown tinge of the *ducta-minniota-versuta* group; fore wings black and white as in *loda* but considerably paler, maculation as in *versuta*. Hind wings: of male white with scattered black scales strongest on the veins, and forming a discal dot; a black terminal line; fringe white, interlined with black: of female, similar to male, but with a somewhat heavier black suffusion.

Perhaps a local race of *versuta* but until the status of the forms of the group is better understood, we prefer to consider this a distinct species.

Holotype.—♂, Provo, Utah.

Allotype.—♀ and *Paratypes*.—1♂ 1♀, same locality.

Notes: Barnes Collection, from Tom Spalding, only 1♀ bearing data (X-1-12).

Catocala delilah form umbella nov.

Similar to *delilah* but with the median area of fore wing strongly suffused with blackish brown.

²—“*Hadena*” or “*Eremobia*” *tenera* Sm. is probably closely allied to *Eumichtis ducta* Grt. and possibly a synonym therefore. We are indebted to Mr. Jeane Gunder for a photograph of the National Museum type and to Dr. H. G. Dyar for permission given to Mr. Gunder to photograph the type. We take pleasure in naming the new *Eremobia* in honor of Mr. Gunder.

Holotype.—♂, and *Allotype*.—♀, Kerrville, Texas.

Paratype.—1 ♂, Black Jack Springs, Tex.

Catocala delilah desdemona form umbra nov.

Similar to typical *desdemona*, but with the median area of fore wing strongly suffused with blackish brown, a parallel form to *umbella* of typical *delilah*.

Holotype ♂ and *Allotype* ♀, Hereford, Arizona, (C. R. Biederman).

Paratypes 12 ♂ 10 ♀ from Hereford, Palmerlee, Paradise, Redington, and Baboquivari Mts., Arizona.

Notes: Types in Barnes Collection; Paratypes in Field, and Canadian National Collection.

Catocala delilah utahensis form swetti nov.

Similar to typical *utahensis*, but with the median area of the fore wing strongly suffused with blackish brown, a parallel form to *umbella* of typical *delilah*.

Holotype.—♀, Vineyard, Utah, (Tom Spalding) ex Coll. L. W. Swett.

Catocala gerhardi sp. nov.³

† *herodias* Auct. nec. Stkr.

1918, Barnes & McDunnough, Catocala Mono., p. 36 partim., pl. VIII, f. 10, *Catocala* (—).

This is the *herodias* of authors but not like type, differing therefrom by the central area of the fore wing from base to outer margin brownish, disconcolorous with the paler gray costal region and the suffusion of the same color along the inner margin.

The type of *herodias* agrees well with Strecker's description, 1876, Lep. Rhop. Het., p. 121, possessing little contrast on the primaries. Structurally it is closely allied to *gerhardi*, and the two may ultimately prove to be subspecies of one another. Superficially typical *herodias* looks like an uncontrasting gigantic specimen of *ultronia*, which is probably the reason why a number of the older authors insisted it was only an *ultronia* variety.

Holotype.—♂, Lakehurst, N. J., (T. D. Mayfield, ex-ova), 12 June 1922.

Allotype.—♀, id., 16 June 1922.

Paratypes.—5 ♂ 3 ♀, Lakehurst and Newark, N. J., Chatham, Mass., T. D. Mayfield, Frederick Lemmer, etc.

Catocala andromedae Gn.

1852, Guenée, Sp. Gen., VII, Noct., III, 36, *Hypogramma*.

1918, Barnes & McDunnough, Illus. N. Am. Sp. Gen. Catocala, p. 36. (partim, nec pl.) *Catocala*.

This species was described from a figure by Abbot. The Barnes Collection possesses material which sorts into two racial forms, six specimens from Florida having the front wings much paler than specimens from N. Y., N. J., Pa., Me., Conn. Some old specimens labeled Harris Co., Texas, and St. Louis, Mo., appear to be like the northern form. These latter are mentioned by B. & McD., 1918, who state, "concerning the authenticity of these labels, however, we know nothing."

³We take great pleasure in naming this beautiful species in honor of our good friend Mr. William J. Gerhard, Curator, Field Museum, who most materially assisted us in our comparisons of types in the Strecker Collection.

Chances are strongly in favor of true *andromedae* being a Gulf Strip Race; so we tentatively propose to call the southern race *andromedae*, and the northern race *tristis* Edw.

Datana perspicua race **opposita** nov.

Similar to normal eastern *perspicua*, but the thorax is considerably lighter, being ochreous rather than rich brown. The primaries are sparsely dusted with darker atoms, but these are so fine they are almost lost, while the ground color is paler than typical for the eastern form; the lines not as heavily marked; the reniform a poorly defined blotch, tending to become obsolescent; the orbicular missing; subapical streak tending to become obsolete.

This form is the exact opposite to the described western forms but agrees with them in the absence of the orbicular and the tendency for the subapical streak to be reduced. From typical *perspicua* it may be told by its paler coloration, and lack of orbicular.

Holotype.—♂, Vineyard, 25-VI-17.

Paratypes.—3♂, Vineyard, 15-VI-18, Eureka, 1-VII-21 and 17-VII-21, all Utah (Tom Spalding).

Fentonaria dorothea Dyar

1895, Dyar, Can. Ent., XXVIII, 176, f. 19, *Macrurocampa*.

race *miranda* Dyar

1905, Dyar, Mus. B'klyn Inst. Sci. Bull., I, 185, *marthesia* var., *Macrurocampa*.

race *frisoni* nov.

The type of *dorothea* is in the Bolter Collection, and through the kindness of Dr. Theodore Frison was brought to Decatur for comparison with the Barnes Collection. We fail to see much difference between *dorothea* and *miranda*. A specimen from High Rolls, N. Mex. agreed well with the unique Las Vegas, N. Mex. type of *dorothea*. A specimen from Durango, Colo. appears to be the same, and had been placed by Dr. McDunnough under *miranda*. We suspect this is much like the Manitou, Colo. specimen included in the original description of *miranda*. If this latter name be restricted to its Arizona types, a slight difference is noted, in *dorothea* the reddish shade at the base of veins 7-8 of the primaries again showing between veins 3-4, whereas in *miranda* the reddish shade is present between veins 7-8 but usually absent between veins 3-4. In some specimens of *miranda* the reddish shade between veins 3-4 is present but obsolescent, and in one specimen before the authors it is quite strong.

At the time the B. & McD. Check List was written there was a specimen in the Barnes Collection determined as probably *dorothea*, which is the reason *dorothea* was listed as a distinct species. The markings are essentially as in *dorothea*, but apically the subterminal shade is more intense and obliterates the usual sagittate black subterminal dashes, while the tornal part of the s.t. line, which in both *dorothea* and *miranda* forms a strong tornal black dash, is not darker than the apical portion of the line, is dull blackish tinged with rufous. The ground color of the primaries is a violaceous-white, not a deep violaceous-gray. The specimen is a female, and its hind wings are paler than in the average male of the other two forms, and very much paler than in any other female we have seen. It may represent a distinct species. Tentatively we prefer to consider it a race of *dorothea*, and have named it *frisoni* in honor of Dr. Frison.

Holotype.—♀, Prov, Utah. (Tom Spalding) VII-14-12, unique.

***Gluphisia septentrionalis* form *opaca* nov.**

Melanic *septentrionalis*, practically uniformly black, the ordinary markings obsolete.

Holotype.—♂, Pittsburg, Pa., 20 Aug., unique.

***Sylepta brumalis* B. & McD.**

1914, Barnes & McDunnough, Contrib., II, (6), 227, pl. I, f. 4. *Sylepta*.

1917, Dyar, Ins. Insc. Menst., V, 71, *cephalis*, *Sylepta*.

Dr. Dyar, 1917, sunk *brumalis* to *cephalis*.

We submitted specimens of *brumalis* to Dr. A. J. T. Janse, asking his opinion on the synonymy. Dr. Janse kindly loaned us a specimen said to be like the British Museum type of *cephalis*, together with genitalic slides of both *brumalis* and *cephalis*. Unless Professor Janse's determination of *cephalis* is incorrect, the two are quite distinct on both habitus and genitalia. *Sylepta pimalis* B. & Benj. is also genitalically distinct.

A NEW EPHemerella FROM ILLINOIS (EPHEMEROPTERA).*

BY J. McDUNNOUGH,

Ottawa, Ont.

***Ephemeralia frisoni* n. sp.**

Male. Head and thorax deep black-brown, pleura tinged with lighter brown; the mesothorax broad for the size of the insect and with the axillary cords scarcely extended beyond tip of scutellum. Abdomen with segments 1-6 and the anterior half of 7 dull semihyaline whitish with traces of a fine ruddy dorsal line and lateral rows of small ruddy spots or streaks situated one on each segment in the central area; posterior half of 7 and 8-10 opaque, pinkish brown, paler ventrally; forceps pale, tinged with brown, a prominent tubercle situated between the limbs at base: setae white, unbanded. Fore legs with the femora light sepia-brown, tibiae and tarsi dull whitish, the former shaded slightly with sepia at base, tibia rather long, more than twice as long as the femur and subequal to the entire tarsus; mid and hindlegs whitish, the femora tinged with brown, femora and tibiae subequal. Wings hyaline with a brown tinge at extreme base; veins and crossveins pale. Length of body, 5 mm.; of forewing 5 mm.

Holotype.—♂, Oakwood, Ill., June 9. (Frison and Hayes) in the Collection of the Illinois State Natural History Survey, Urbana, Ill.

Paratypes.—2 ♂, same data; one No. 2424 in the Canadian National Collection, Ottawa.

The subimago is similar to the adult but the abdominal maculation (judging by a single specimen in alcohol) is much better defined. The species, according to genitalia, belongs in the *bicolor* group, the penes being very similar to those of this species; it is at once distinguished by the pale abdomen and the much longer fore tibia. I take pleasure in naming it after Dr. T. H. Frison who has sent me for study so many interesting Ephemeroptera from Illinois.

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

STUDIES IN CANADIAN DIPTERA—III.

THE SPECIES OF THE TACHINID GENERA RELATED TO *LYDELLA*, AS REPRESENTED
IN THE CANADIAN NATIONAL COLLECTION.

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In the Canadian Entomologist for November, 1925, I reviewed the Canadian species of *Lydella* Desv. As certain changes in the terminology therein proposed are necessary it seems advisable to review the related forms and present a key to the genera concerned. The species under discussion, with some exceptions, trace to *Masicera* Macq. in keys dealing with the Nearctic fauna and the key to the genera may be used to supplement those in Williston's Manual, 1908, and Coquillett's "Revision."

In considering the generic limits I have made use of Palaearctic species and in most cases have had the genotypes before me. The genus *Pelatachina* undoubtedly comes close to *Dexodes* and is therefore included in the present paper. No doubt there are other genera which should be included and probably some of the generic names here used will ultimately be replaced by older names as the result of further study. The synonymy given is far from complete as I have only attempted to give this for names more or less commonly used and recognized as valid in the past. *Compsilura* is undoubtedly related to *Lydella* but is separated by its pilose eyes and very greatly reduced ocellar bristles. *Laximasicera* differs from *Erycia* in the entire absence of ocellar bristles. *Masicera* Macquart is considered a synonym of *Erycia* Desvoidy and the name therefore disappears from our lists.

KEY TO GENERA

1. Infrasquamal spinules present 2.
Infrasquamal spinules absent 3.
2. Ocellar bristles absent; eyes sparsely pilose *Compsilura* Bouche.
Ocellar bristles usually strong; eyes bare *Lydella* Desv.
3. Ocellar bristles absent *Laximasicera* n. g.
Ocellar bristles well developed 4.
4. Three pairs of presutural acrostical bristles, the posterior pair very close to the suture 5.
Two pairs of presutural acrosticals, or if three the posterior pair is well in front of the suture and there are only two pairs of presutural dorsocentral bristles 6.
5. Four pairs of marginal scutellars, the apical pair decussate; posterior sublateral bristles present (*Masicera* Macq.) *Erycia* Desv.
Three pairs of marginal scutellars, the apical pair never decussate *Pelatachina* Meade.
6. Facial ridges bristly on the lower half or more *Allophorocera* Hend.
Facial ridges bristly on less than the lower third 7.
7. Third antennal segment but little longer than the second; anterior half of oral margin strongly oblique in profile *Pelatachina* Meade.
Third antennal segment more than one and one-half times as long as the second; oral border oblique on less than the anterior fourth. (*Parameigenia* Tns., *Neothelaira* Tns.) *Dexodes* B. B.

Lydella Robineau-Desvoidy.

Essai Myod., 112, 1830.

Paradexodes Towns., Smiths. Misc. Coll., li, 101, 1908.*Eucelatoria* Towns. Ann. Ent. Soc. Am., ii, 249, 1909.*Phrynolydella* Towns., Proc. U.S.N.M., lvi, 275, 1919.*Aubaeannetia* Towns., Proc. U.S.N.M., lvi, 570, 1919.

Provided some character for the separation of the male of *Aubaeannetia assimilis* Towns. can be found the genus should be recognized, although the small posterior presutural acrosticals indicate a close relationship to *Dexodes* B.B.

In the Canadian Entomologist for November, 1925, (lvii, 283), I published a key to the species of *Lydella* contained in the Canadian National Collection. Dr. Aldrich has been kind enough to draw my attention to some possible synonymy and also to furnish me with examples of several species coming within the limits of the genus as defined in that paper. As a result I am now enabled to submit a key to the Nearctic species of the genus and to give some additional notes.

LYDELLA—KEY TO SPECIES.

1. Facial ridges with bristles on lower three-fourths 2.
- Facial ridges bristly on lower half or less 3.
2. Apex of fourth abdominal segment reddish *armigera* Coq.
Fourth abdominal segment wholly black in ground color *minor* Curran.
3. Abdomen with large, rectangular ochreous pollinose spots, the ground color largely reddish beneath them *lathami* Curran.
Abdomen not so marked, the pollen whitish or more uniformly distributed 4.
4. Face, upper half of cheeks and orbits, golden yellow pollinose 5.
- Face greyish or white pollinose, sometimes a little brassy above 7.
5. Apical scutellars very small or absent, never decussate *aurifrons* Tns.
Apical scutellars fairly strong, normally decussate 6.
6. Apex of scutellum distinctly reddish; abdomen almost wholly opaque with pollen, only the narrow segmental apices dark from dorsal view; male without small anterior bristle beyond middle of middle tibiae
..... *hyphantriae* Tothill.
Scutellum wholly black; apices of abdominal segments broadly shining from most views; both sexes with a small anterior bristle beyond the middle of the middle tibiae *eufitchiae* Towns.
7. Abdomen yellowish grey pollinose with at most the very narrow apices of the segments dark 8.
- Abdominal segments with at least broad shining posterior margins 9.
8. First two antennal segments reddish; parafacials with short spinules on upper fourth *Cryptomeigenia lateralis* Curran.
Antennae wholly black; only a few bristles below frontals .. *obscura* Curran.
9. Middle tibiae with strong median antero-dorsal bristle and weak one at basal third; third antennal segment three times as long as second *Aubaeannetia assimilis* Towns.
Middle tibiae with two or three strong antero-dorsal bristles, or if with two the facial ridges bristly almost to the middle 10.
10. Third antennal segment of male about twice as long as the second; decussate scutellars absent *nigripes* Fallen.
Third antennal segment of male three times as long as the second; decussate

- scutellars present II.
 II. Costal spine strong; a strong anterior bristle beyond the middle of the middle tibiae (*connecta* Curran) *polita* Towns.
 Costal spine not conspicuous; no post-median bristle on antero-dorsal surface of middle tibiae sp. n

Lydella eufitchiae Townsend.

Masicera eufitchiae Towns., Trans. Am. Ent. Soc., xix, 286, 1892.

Some doubt as to whether *L. eufitchiae* Towns. was correctly identified in the United States National Museum and Canadian National Collection made the examination of Townsend's type necessary. Both of the types in the Kansas University Museum are males, but it is quite evident, considering the shape of the abdomen, that the female has a long ovipositor of the piercer type. The types agree with males of *L. hyphantriae* in the Canadian National Collection except that they are smaller. The holotype (lectotype, Curran) is from Colorado and has strong decussate scutellars while these are somewhat weaker in the Illinois specimen. This latter specimen is undoubtedly *hyphantriae* Toth., the abdomen being almost wholly pollinose. In addition to the holotype I have before me a male and female from the Gypsy Moth Laboratory, Melrose Highlands, Mass., both evidently reared, and a male from Prince Rupert, B. C., collected by Mr. E. R. Buckell on July 3rd, 1924. Otherwise, all the specimens in the Canadian National Collection belong to *hyphantriae* and it is safe to say that a large proportion of the specimens in various collections going under *eufitchiae* are referable to *hyphantriae*.

Lydella hyphantriae Tothill.

Bull. 3, new series, (Technical), Canadian Dept. of Agric., 43, 1922.

This species is very close to *eufitchiae* Towns., and is often separable only with difficulty. The abdomen is less inclined to appear shining, being almost wholly pollinose, the apex of the scutellum is always rather reddish or yellowish and there is no anterior bristle beyond the large median one on the middle tibiae in the male. In the female there are more short spines on the ventral edges of the tergites. As a rule this species is considerably larger than *eufitchiae*, but a female from Melrose Highlands does not differ in size from most specimens of that species.

L. hyphantriae was described from specimens from British Columbia but considerable doubt exists as to the identity of all the specimens and only the holotype can be considered to belong here without doubt. The drawing of the female genitalia was made from a paratype and Dr. Aldrich informs me that this traces to *minor* Curr. The male paratype in the Canadian National Collection proves to be *Zenilla blanda* O. S., but I can find no trace of the second male mentioned in the description. The color of the frontal pollen varies from strongly golden yellow to gray with strong golden reflections in certain lights.

Lydella polita Townsend.

Phrynolydella polita Towns., Proc. U.S.N.M., lvi, 572, 1919.

Lydella connecta Curran, Can. Ent., lvii, 286, 1925.

Through the courtesy of Dr. Aldrich a paratype of *L. polita* has been donated to the Canadian National Collection by the United States National Museum. A comparison of *L. connecta* indicates the above synonymy. Several examples of both sexes have been received from Mr. G. S. Brooks, all taken in Manitoba.

Lydella laterale Curran.

Can Ent., Ivii, 28, 1925.

Regardless of the bare parafacials, this species should undoubtedly be transferred to the genus *Cryptomeigenia* B.B. It belongs there rather than in *Lydella* and indicates a close relationship between the two genera.

Lydella assimilis Townsend.

Aubaeonettia assimilis Townsend, Proc. U.S.N.M., Ivi, 570, 199.

Lydella albifacies Curran, Can. Ent., Ivi, 285, 1925. (Not *Dexodes albifacies* Tns.)

This is the species previously recorded from Canada and included by me in the key to *Lydella* under the name *albifacies* Tns. *L. assimilis* and *Dexodes albifacies* are extremely similar but the latter lacks the spinules beneath the squamae, the posterior pair of presutural acrostical bristles are absent and the posterior sublateral bristle is never developed. In *assimilis* there is usually at least one infrasquamal spinule, usually two or more, on either side and they are very rarely absent on one side, the posterior pair of presutural bristles is well developed, though weaker than the others, and the posterior sublateral is almost always well developed. It may be that these characters will prove of very little value in the end, even for specific separation: if they are ignored it is quite impossible to separate the two forms.

This is the only species of *Lydella* in which the female ovipositor is not elongate and the abdomen carinate beneath, but it is impossible to distinguish the male from those of *Lydella*. For this reason the species is retained in the genus, although it would be an advantage if it could be separated upon some character common to both sexes, in which case *Aubaeonettia assimilis* would be the correct name for it.

Laximasicera n. gen.

This genus agrees entirely with *Erycia* Desv. s.s. differing only in the entire absence of ocellar bristles. *Genotype*: the following species.

Laximasicera sexualis n. sp.

Outer vertical bristles of male present, divergent and rather strong; male with sexual patch on under side of third tergite; black, the palpi, apex of scutellum and stem of the halteres, reddish. Length, 9 mm.

Male. Front slightly wider than eye, the wine-red frontal vitta in front of the ocelli twice as wide as parafrontal opposite; about nine pairs of frontals, the lower three pairs situated below the base of the antennae, strongly diverging, the upper two or three reclinate; a second row of finer bristles on the lower half of the parafrontals; a post-occipital row of short black bristles and another partial row above; the occipital cilia are connected with the black hairs of the cheeks by several rows of black hairs. Parafacials with bristles on less than the lowest fifth; face moderately retreating, the oral margin slightly produced. Palpi brownish red. Antennae black, reaching the lowest fifth of the face, the third segment broad and thick, sub-truncate, about twice as long as the second; arista thick on the basal two-thirds, tapering from the middle, obscurely pubescent. Head silvery white pollinose, the occipital pile whitish.

Thorax moderately cinereous pollinose, the vittae distinct. Acrosticals 3-3; dorso-centrals, 3-4; sternopleurals 4; scutellum with four pairs of marginals, the apical decussate pair fairly weak, a pair of discals.

Middle tibiae with two strong and two or three weaker antero-dorsal bristles; pulvilli yellowish, elongate.

Wing cinereous hyaline, tinged with luteous on the basal half in front; third vein with a single basal bristle posterior crossvein joining the fourth vein at the apical fourth of its penultimate section; bend of fourth vein sub-angular, the apical section straight; reaching the costa far before the wing-tip, the apical cell widely open. Squamae white, the halteres reddish with brownish knob.

Abdomen moderately cinereous pollinose, the first segment and apices of the remainder bare or nearly so, the median vitta rather distinct in some views. First and second segments with one pair of marginals, the third with a row; fourth almost wholly sparsely bristly, the abdominal bristles coarse. Hair of the abdomen reclinate. The sexual patch is large, rectangular, composed of short, fine, appressed pile on the ventral part of the third segment.

Holotype, ♂, Waterton, Alta., July 10, 1923, (E. H. Strickland), No. 2242 in the Canadian National Collection, Ottawa.

Erycia Desvoidy.

Mydaires, 146, 1830.

Masicera Macquart, Soc. Sci. Lille, 285, 1833 (1834).

Ceromasia Rondani, Dipt. Ital. Prod., i, 71, 1856.

Hemimasicera Brauer and Bergentz, Denkschr. Akad. Wien., Ivi, 87, 1889.

Pilatea Townsend, Ent. News, XXVII, 178, 1916.

The separation of *Erycia* and *Masicera* is made upon the presence or absence of orbital bristles in the male and in the width of the front in both sexes, but neither character can be considered of more than specific value. The genitalia of the males have a certain similarity of structure in all the species although they do show specific variation in most cases. Also, there is a well marked difference between the genitalia of *Erycia* and *Dexodes*.

ERYCIA—TABLE OF SPECIES.

1. Middle tibiae at most with one strong and one quite weak antero-dorsal bristle 2.
- Middle tibiae with two or more strong dorso-central bristles 5.
2. Dorso-centrals 3-3. (Mass., Colo., Ohio.) *exilis* Coq.
- Dorso-centrals 3-4 3.
3. First two antennal segments and base of the third reddish; front light golden pollinose; male outer forceps strongly widened near the middle; pteropleural bristle absent *arator* Ald.
- Antennae wholly black, or if the second segment is somewhat reddish the front usually gray, scutellum broadly yellow apically and the abdomen with only narrow segmental apices dark; pteropleural bristle always present 4.
4. Front dull golden pollinose; antennae usually wholly black the basal segments rarely reddish; outer forceps not constricted basally *celer* Coq.
- Front grayish pollinose; second antennal segment partly reddish; outer forceps of male strongly widened on apical half, tapering from apical fourth *delecta* n. sp.
5. Four sternopleurals 6.
- Three sternopleurals (rarely only two) 8.
6. Apical scutellars sub-erect, cruciate; scutellum normally wholly black; apices of abdominal segments broadly shining black *myoidaea* Desv.
- Apical scutellars horizontal, cruciate; scutellum largely reddish; apices of

- abdominal segments at most narrowly shining, almost wholly pollinose ... 7.
7. Male outer forceps less than one and one-half as long as wide; apices of abdominal segments rather broadly shining, very thinly brown pollinose (Europe) *fatua* Meig.
Male outer forceps at least twice as long as wide; abdominal segments pollinose to the apices, which are however, brownish (Europe) *ferruginea* Meig.
8. Second abdominal segment without well differentiated discals but often with stout, bristly hairs 9.
Second abdominal segment with well differentiated, strong discals 10.
9. Third abdominal segment on either side with a large area of appressed, short fine black hair (Europe) *pratensis* Meig.
Third abdominal segment of male without such hair; male front bearing two pairs of orbitals, but these are not always regularly developed (Europe) *silvatica* Fall.
10. Abdomen, from most views, with the broad apices of the segments shining black; blackish looking species 14.
Abdomen yellowish gray pollinose, the segmental apices only narrowly blackish; grayish looking species, the fourth segment usually rather yellowish 15.
14. Usually at least the basal two-thirds of the abdominal segments appears whitish pollinose; outer forceps of male genitalia narrow basally, broad on apical half; second and third abdominal segments usually with more than one pair of discals (B. C.) *aldrichi* n. sp.
Not more than the basal half of the abdominal segments appears whitish pollinose; outer forceps wholly rather narrow; only a single pair of discals on the second and third abdominal segments; front of female golden yellow *varifrons* n. sp.
15. Front in both sexes wider than one eye *rutila* Meig.
Front narrower than one eye in both sexes *celer* Coq.

Erycia delecta n. sp.

Black, the palpi and apex of scutellum reddish. Related to *celer*, from which it differs in the shape of the male genitalia: the outer forceps are strongly narrowed on the sub-basal third as in *arator*, from which it is distinguished by the presence of a strong pteropleural bristle and gray pollinose head, while the outer forceps are apparently longer. Length, 9 mm.

Male. Head gray pollinose, rather silvery, the front with scarcely any yellow tinge, a little more than one-third the width of one eye; about nine pairs of frontals, the upper two reclinate, the lower three below the base of the antennae; ocellars long. Occipital cilia with three rows of black hairs connecting them with the black hair on the cheeks; a post-occipital row of short bristles also present; pile of the occiput whitish. Parafacials narrowed below; face rather strongly receding, the vibrissal angles not produced, the ridges with bristly hairs on the lower fourth. Antennae black, the segmental incisures reddish; third segment broad, five times as long as the second, the apex rounded; arista pubescent, thickened on the basal half, tapering from the basal fourth. Palpi reddish with brown base.

Thorax rather thickly gray pollinose, the vittae fairly wide and distinct. Acrostical bristles 3-3; dorso-centrals 3-4; sternopleurals 2-1. Scutellum with

four pairs of marginals, the apical pair decussate, and a pair of discals; the apical fourth or more reddish.

Middle tibiae with two antero-dorsal bristles, the basal one weak; pulvilli long, luteous. Tibiae rather reddish.

Wings cinereous hyaline; apical cell ending moderately before the apex of the wing, the angle of the fourth vein sharply rounded, the apical section almost straight, the posterior crossvein joining its penultimate section near its apical fourth; two or three basal bristles on the third vein; posterior cross vein oblique, gently bisinuate. Squamae white; halteres yellow.

Abdomen grayish pollinose, sub-tessellate, the segmental apices bare; a narrow median vitta evident in some views. First and second segment with one pair of marginals, the second and third each with a pair of discals, the latter with a row of marginals, the fourth with bristles scattered over the apical three-fourths. Outer forceps almost as long as the third antennal segment, narrowed to about half their width before the middle, tapering on the apical fifth.

Holotype—♂, Winnipeg, Manitoba, July 6, 1925, (A. V. Mitchener), No. 2243 in the Canadian National Collection, Ottawa.

Erycia exilis Coquillett.

Masicera exilis Coq., Rev. Tachinidae, Revised Index, p. 156, 1897.

Masicera tenthredinarum Coq., Rev. Tachinidae, 114, 1897 (not Townsend).

A single specimen from Illinois is in the Kansas University Museum. Apparently it is this species but it is not possible to be certain.

Erycia arator Aldrich.

Masicera arator Aldrich, Proc. U.S.N.M., lxvi, Art. 18, 32, 1925.

A paratype was reared from "*Tipula* larva" by the late James Fletcher, the larva coming from Chelsea, Qué. I have not seen the species.

Erycia celer Coquillett.

Masicera celer Coquillett, Rev. Tachinidae, 114, 1897.

Pilatca celer Tns. Ent. News, xxvii, 178, 1916.

Several specimens from Point Pelee, Ontario, June, (G. S. Walley), and five from Texas.

This form is related to *rutila* Meigen, but is at once distinguished by the much narrowed front in both sexes and the absence of a partial secondary row of frontal bristles. There may be one or two antero-dorsal bristles on the middle tibiae.

Erycia rutila Meigen.

Tachina rutila Meigen, Syst. Beschr., iv, 382, 1824.

Tachina festinans Meigen, Syst. Beschr., iv, 384, 1824.

Masicera festinans Coq., Rev. Tachinidae, 114, 1897.

Many specimens from Nova Scotia, (R. P. Gorham) and British Columbia, (E. R. Buckell, C. Garrett, R. C. Treherne). The Nova Scotia specimens were reared from *Cingilia catanaria*.

Erycia aldrichi n. sp.

Black, the palpi more or less reddish on the apical half, halteres yellow, squamae whitish. Length, 7.5 to 9 mm.

Male. Head with moderately dense grayish pollen which has a strong brassy tinge or is almost wholly brassy; front rather thinly pollinose above, about four-fifths as wide as eye, parafrontals each one-fifth wider than the brownish red frontal vitta, with two irregular rows of hairs; about eleven pairs of frontals, the

upper two reclinate, the lower three below the base of the antennae; ocellars long. A row of bristly black hairs behind the occipital cilia, expanding into two or three rows below; cheeks with gray pollen and black hairs, one-fourth the eye-height. Parafacials strongly narrowed below; face rather strongly retreating, the oral margin somewhat produced, the lower fourth of the facial ridges with bristly hairs which decrease in length upwards. Palpi reddish with blackish base. Antennae deep black, reaching to beyond the lowest fifth of the face; third segment about five times as long as the second, very broad, obtusely rounded apically; arista short pubescent, thickened on basal third. The oral margin in front and the soft parts of the face are rather reddish in ground color; occipital pile yellowish.

Thorax moderately gray pollinose, the narrow vittae fairly distinct. Acrostical bristles 3-3; dorso-centrals 3-4; sternopleurals 2-1; four pairs of fine marginal scutellars, the apical pair decussate, the discal hairs strong, the two pairs of discal bristles not strongly differentiated.

Femora partly gray pollinose; pulvilli long, yellowish; middle tibiae with three or four antero-dorsal bristles.

Wings cinereous hyaline, the veins black; angle of the fourth vein rounded, the apical section almost straight; posterior crossvein only gently curved near its base, joining the penultimate section of the fourth vein near its apical fourth; two or three bristles on the base of the third vein.

Second to fourth abdominal segments thinly whitish pollinose on the basal two-thirds, the pollen more or less distinctly interrupted in the middle. First and second segments each with a pair of strong marginals, the second and third with two or three pairs of discals, the third with a row of marginals, the fourth segment with discals scattered over most of its surface, with two rows of strong ones. Hair of the abdomen stout, erect towards the middle of the dorsum. Outer forceps almost as long as the third antennal segment, narrowed sub-basally and tapering to an obtuse point below on the apical sixth.

Female. Front a little wider than eyes, with two pairs of orbitals; outer verticals half as long as the verticals; third antennal segment but little wider than the second and about three and one half times as long. Pulvilli short; genital opening rather slit-like.

Holotype.—♂, Hedley, B. C., Aug. 29, 1923 (C. B. Garrett), No. 2240 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—6 ♂, 1 ♀, same data.

In many respects this species resembles *Dexodes aurifrons*, Coq. but it differs from that in possessing the posterior pair of presutural acrostical bristles and quite different genitalia. Dr. Aldrich determined specimens as "near *arator* Ald."

Erycia varifrons n. sp.

Related to *aldrichi* but the outer forceps of the male are wholly rather narrow, the abdominal segments are somewhat more widely shining and there is only a single pair of strong discals on the intermediate abdominal segments. Length, 7.5 to 9 mm.

Male. Front five-sevenths as wide as eye, the wine-red frontal vitta almost as wide as a parafrontal. Head gray pollinose with whitish sheen, the

frontal pollen with ochreous tinge Parafrontals with scattered black hairs, a few of them bristle-like; about eleven pairs of frontals, the upper two or three pairs reclinate, four pairs situated below the base of the antennae; ocellars long. A row of black bristles behind the occipital cilia, the latter connected with the black hair of the cheeks by several rows of black hairs. Cheeks slightly over one-fourth the eye-height; parafacials narrowed below, the facial ridges with bristles on the lower fifth; face moderately retreating, the oral margin slightly produced. Palpi reddish. Antennae black, the basal segments with some reddish portions, reaching the lowest sixth of the face; third segment hardly four times as long as the second, rather wide, somewhat tapering on its apical third, the apex truncate, with rounded corners; arista very short pubescent, thickened on its basal third.

Thorax moderately gray pollinose, the vittae distinct. Acrostical bristles 3-3; dorso-centrals 3-4; sternopleurals 2-1; four pairs of marginal scutellars and one or two pairs of discals, the apical desussate scutellars weakest.

Middle tibiae with three or four antero-dorsal bristles; pulvilli elongate, pale yellow.

Wings cinereous hyaline; bend of fourth vein sharply rounded, the apical section almost straight; posterior crossvein strongly curved near its base, joining the penultimate section of the fourth vein at its apical two-fifths. Squamae whitish; halteres yellow.

A little more than the basal half of the second to fourth segments is white pollinose; in some views there is an obscure median dark vitta. First and second segments each with a pair of marginals, the second and third each with one pair of discals, the third with a row of marginals, the fourth with bristles scattered over the apical three-fourths. Outer genital forceps almost as long as the third antennal segment, narrow, tapering to an obtuse point below.

Female. Front a little narrower than one eye, golden yellow; two pairs of strong orbitals; third antennal segment two and one-half times as long as the second, narrower, not tapering.

Holotype, ♂, *Allotype*, ♀, (in copula) Lillooet, B. C., May 27, 1925, (E. R. Buckell), No. 2241 in the Canadian National Collection, Ottawa.

Paratypes, 2♂, same data; ♂ Keremeos, B. C., June 30, 1923 (C. Garrett).

Erycia pratensis Meigen.

Tachina pratensis Meigen, Syst. Beschr., iv, 318, 1824.

Two males, one from Austria the other from Italy. The former specimen was determined by Stein; the latter by Bezzi as *silvatica*. The differences between these two species are indicated in the key.

Erycia myoidaea Desvoidy.

Lydella myoidaea Desvoidy, Myod., 114, 1830.

Eighteen specimens from Hull, Que.; Ottawa, Ont.; Winnipeg, Man., (J. B. Wallis); Blue Island, Alta., (E. H. Strickland); Salmon Arm, B. C., (A. A. Denys). The Ottawa specimens were reared from *Papaipema appassionata*.

Erycia fatua Meigen.

Tachina fatua Meigen, Syst. Beschr., iv, 385, 1824.

One specimen, Italy, determined by Bezzi.

Erycia ferruginea Meigen.*Tachina ferruginea* Meigen, Syst. Beschr., iv, 382, 1824.One specimen, Finkenkrug, near Berlin, Germany, det. by Kramer. This is the type of the genus *Erycia*.**Dexodes** Brauer and Bergenstamm.*Zweifl. der. Kaiserl. Mus.*, iv, 87, 1889.*Neothelaira* Townsend, Journ. N. Y. Ent. Soc., xx, 109, 1912.*Parameigenia* Townsend, Proc. U.S.N.M., vi, 576, 1919.

There are seven species referable to this genus in the Canadian National Collection. *Neothelaira* Tns. differs from the type of *Dexodes* in possessing a small pair of decussate scutellars but this character can hardly be considered as of generic importance as adventitious hairs or weak bristles are often present in the other species. *Parameigenia* Townsend shows no characteristic difference from *D. albisquama* which can be considered of more than specific importance. The two species, *xylota* and *epilachnae* differ from the remainder of those in the genus by possessing three pairs of presutural acrostical bristles but it will be observed that this character is of little value in the genus *Pelatachina* and in addition, the posterior pair is situated about half way between the posterior pair of presutural dorso-centrals and the suture and not close to the suture as is typically the case in *Erycia*. *Epilachnae* was described in the genus *Paradexodes* which is characterized by the presence of infra-squamal spinules.

DEXODES—TABLE OF SPECIES.

1. Pollen of the head deep golden yellow *aurifrons* Coq.
Pollen of the head white or argenteous 2.
2. Third vein bristly more than half way to the small crossvein *chaetoneura* Coq.
Third vein with not more than five bristles basally 3.
3. A single bristle on the antero-dorsal surface of the middle tibiae 4.
Two or more antero-dorsal bristles on the middle tibiae, the second one sometimes weaker 5.
4. Palpi wholly black; third antennal segment broad, not narrowed on basal portion; wings unicolorous or almost so *xylota* n. sp.
Palpi reddish on apical half or more; third antennal segment over three times as long as wide, narrowed on basal half; wings dark basally (Mexico, Texas) *epilachnae* Ald.
5. Less than the basal half of the abdominal segments white pollinose 6.
Abdomen cinereous pollinose with the segmental apices and obscure median vitta black. (Europe) *albisquama* Zett
6. Third abdominal segment of the male almost wholly bristly; apex of third antennal segment oblique, its upper corner rather acute *valida* n. sp.
Third abdominal segment bristly on apical half except in the middle where it is bristly to the base; third antennal segment with sub-truncate apex, the lower corner rounded *albifacies* Tns.

Dexodes aurifrons Coquillett.*Masicera aurifrons* Coq., Rev. Tachinidae, 115, 1897.*Neothelaira dexina* Townsend, Journ. N. Y. Ent. Soc., xx, 109, 1912.

One male, Onah, Manitoba, July 18, 1921, (N. Criddle), and a female, Low Bush, Lake Nipigon, Ontario, Aug., 1925, (N. K. Bigelow).

Dexodes chaetoneura Coquillett.

Masicera chaetoneura Coq., Rev. Tachinidae, 115, 1897.

Several specimens from Fort Wrigley, Mackenzie River, N. W. T., July and August, 1923, (C. H. Crickmay) and one from Husavick, Manitoba, July 3, 1910, (J. B. Wallis).

Dexodes albifacies Townsend.

Paradexodes albifacies Towns., Tax. Musc. Flies, 102, 1908.

Several specimens from Point Pelee, Ontario, May 28, 1925, (G. S. Waller), a female from Severn, Ontario, June 16, 1925 (Curran) and a male from Franconia, New Hampshire, July 2, 1915 (C. H. T. Townsend). A pair of specimens loaned by the U. S. N. M. have also been critically examined. See also the note on *Lydella assimilis* Towns.

Dexodes valida n. sp.

Rather similar to *albifacies* Tns. but the differently shaped third antennal segment and arrangement of the abdominal bristles separate it. Black, the palpi and halteres reddish yellow. Length, 8.5 mm.

Male. Front half as wide as eye, the frontal vitta twice as wide as parafrontal at upper fourth, hardly as wide in front, the sides of the front almost parallel on the upper half; about twelve pairs of frontals, the upper two reclinate, the lower three or four below the base of the antennae; ocellars strong. Occipital cilia extending to the cheeks, the second row reaching only to the lower edge of the eye; occipital pile white. Cheeks with black bristly hair. Parafacials almost half as wide below as the third antennal segment; facial ridges bristly on the lowest fourth; face rather strongly retreating, the vibrissal angles prominent. Arista pubescent, slender, thickened on the basal fifth.

Thorax rather thinly white pollinose, the vittae distinct from posterior view. Acrosticals 2-3; dorsocentrals, 2-3; sternopleurals, 2-1; three pairs of marginal scutellars, no discals. Apical two-thirds of the scutellum rather whitish pollinose.

Middle tibiae with two rather weak antero-dorsal bristles in addition to a strong one. Pulvilli reddish yellow, elongate.

Wings cinereous hyaline, slightly luteous in front towards the base. Posterior crossvein rather strongly curved at its posterior third, joining the penultimate section of the fourth vein at its apical third; apical crossvein almost straight, the bend sub-angular; three basal bristles on the third vein. Squamae conspicuously yellowish.

Basal third of the intermediate and one-fourth of the fourth abdominal segments, white pollinose, less widely so in the middle. First segment with two pairs of marginals, second with two pairs of discals, the posterior pair widely spaced, and a row of marginals, those towards the sides weaker. Third and fourth segments almost wholly bristly, the bristles long and fairly abundant.

Holotype, ♂, Sudbury, Ont.; No. 2244 in the Canadian National Collection, Ottawa.

Dexodes albisquama Zetterstedt.

Tachina albisquama Zett., Dipt. Scand., iii, 1037, 1844.

A male, "Schweiz," determined by Stein. This is the genotype of *Dexodes* although there might be some question raised in this connection as Brauer and Bergenstamm named *spectabilis* Meigen as the genotype, but their specimen has

been shown to have been *albisquama* and not *spectabilis*. On the principle that a genotype must possess the characters enumerated in a generic description (which seems the only logical procedure) provided a description is given, it is obvious that *Demoticus plebejus* Fallen, of which *spectabilis* Meigen is considered synonymous, cannot be the genotype of *Dexodes*, although named as such by Brauer and Bergenstamm.

Dexodes epilachnae Aldrich.

Paradexodes epilachnae Ald., Proc. Ent. Soc. Wash., xxv, 95, 1923.

This species and the following show some affinities to the genus *Tachinophyto* Tns. but appear to be better placed in *Dexodes*. I have before me two paratypes from Mexico and two additional specimens from Texas.

Dexodes xylota n. sp.

Superficially resembles *Masicera senilis* Coq., but the posterior pair of presutural acrostical bristles is situated well in front of the suture and the posterior sub-lateral bristle is absent. Very close to *epilachnae* Aldrich. Black, the second and third abdominal segments of the male with large, pale reddish lateral areas. Length, 5.5 mm.

Male. Head silvery white; frontal vitta black, hardly as wide as para-frontal opposite any given point; about eleven pairs of frontals, the upper three reclinate, two or three pairs below the base of the antennae; ocellars strong; outer verticals scarcely evident. Front hardly half as wide as eye, the sides parallel above, diverging on the lower three-fifths. A row of black bristles behind the black occipital cilia; pile of the occiput whitish. Cheeks with sparse black hairs, about one-fifth the eye-height. Vibrissae level with the oral margin, four or five bristly hairs above them; parafacials narrowing below where they are not over one-third as wide as the third antennal segment; oral margin scarcely produced. Antennae reaching the lowest sixth of the face; third segment twice as long as the second, wide, its apex sub-truncate, the corners rounded; arista long, slender, thickened on less than the basal fifth, practically bare, the penultimate segment shorter than wide.

Thorax rather thickly silvery gray pollinose; in front of the suture with four fairly wide black vittae, the outer ones wider and extending to behind the base of the wing; immediately behind the suture is a transverse, though almost square, black spot narrowly separated from the outer vittae. Acrosticals, 3-4; dorso-centrals 3-3; sternopleurals, 3; scutellum with three pairs of marginals, the second pair weakest, and above the apex a pair of hairs while there is a pair of weak discals. Scutellum rather brownish pollinose on the basal two-thirds.

Front tibiae with a single posterior bristle at the apical third; middle tibiae with a single antero-dorsal bristle beyond the middle. Pulvilli long, pale luteous.

Wings cinereous hyaline, the base somewhat luteous; two or three small bristles at the base of the third vein. Bend of the fourth vein gently rounded, the apical section almost straight, almost touching the third vein a little before the tip of the wing.

Basal half of the second to fourth abdominal segments, expanding to three-fourths at the sides, whitish pollinose, the abdomen elsewhere more or less distinctly brownish pollinose from some views. First segment with a pair of strong marginals; second with a pair of discals and one or two pairs of margin-

als; third with two or three pairs of discals and a row of marginals; fourth with two rows of discals and a weak terminal row. The abdominal bristles are long and rather slender and are evidently somewhat variable as they are not regularly arranged. However, there are more on one side than on the other which indicates deformity of a certain type. Posterior forceps split apically.

Females. Front four-fifths as wide as eye, with two pairs of orbitals; outer verticals strong; antennae somewhat narrower.

Holotype, ♂, Orillia, Ontario, June 7, 1925, (Curran), No. 2239 in the Canadian National Collection, Ottawa.

Allotype, ♀, same locality, June 11, 1925.

This species is very similar to *D. epilachnae* Ald., the markings of the thorax being almost the same. The antennae of *epilachnae* are much narrower, especially in the male.

Pelatachina Meade.

Ent. Month. Mag., (2), v, 109, 1894.

Eohyria Townsend, Pr. Biol. Soc. Wash., xxviii, 23, 1915.

This genus has been placed in the Dexiinae but its proper position is evidently between the Tachiniinae and Dexiinae, since it forms one of the group in which all the characters separating the two subfamilies show considerable variation. There are three Nearctic and one Palaearctic species.

PELATACHINA—TABLE OF SPECIES.

1. First abdominal segment with two pairs of marginal bristles; legs wholly black *limata* Coq.
First abdominal segment with only one pair of marginals 2.
2. Wings strikingly yellowish basally and anteriorly; posterior presutural acrosticals usually absent *tibialis* Fallen.
Wings not conspicuously yellowish basally 3.
3. Apices of the abdominal segments broadly shining; tibiae reddish *orillia* n. sp.
Abdomen practically wholly pollinose; tibiae black *pellucida* Coq.

Pelatachina orillia n. sp.

Length, 8 mm.

Female. Black, the tibiae dark luteous. Front three-fourths as wide as eye, with three pairs of divergent orbitals, the upper pair rather weak, about six pairs of cruciate frontals one of which is situated beneath the base of the antennae; ocellars strong; outer verticals two-thirds as long as the verticals; parafrontals of equal width, hardly as wide as the reddish brown frontal vitta; a few hairs in addition to the bristles. Occiput with black bristly hairs except near the neck and below, where there is fine whitish pile. Width of cheeks equal to two-sevenths the eye-height, with a few black bristles. Face moderately retreating, the oral margin slightly produced, a few short, bristly hairs above the vibrissae. Apex of the second antennal segment brownish red; third segment broad, widened on the apical half, sub-truncate, the corners rounded, hardly one and one-third as long as the second segment; arista microscopically pubescent, thickened and tapering on the basal third, the penultimate segment scarcely longer than wide; antennae reaching the lowest fifth of the face. Palpi brownish, rather thick.

Thorax rather thickly gray pollinose; from posterior view with three broad black vittae, the median one extending to a little behind the suture and wider than the others which are interrupted at the suture. From in front there

appear to be four rather narrow vittae. Acosticals 2-3; dorso-centrals, 3-3; sternopleurals, 2-1; scutellum with three pairs of strong marginals, evidently a pair of small, hair-like apicals and a pair of weak discals.

Middle tibiae with three or four antero-dorsal bristles on the basal half.

Wings cinereous hyaline with yellowish tinge basally; a single long basal bristle on the third vein; angle of the fourth vein sharply rounded, the portion beyond the bend slightly oblique on its basal half, thence curved to join the costa somewhat before the apex. Squamae white, with yellowish border. Halteres yellow.

About the basal half of the second to fourth segments cinereous pollinose, the pollen not dense except at the bases of the segments. First segment with a pair of strong dorsal bristles well before the apex; second and third each with two pairs of discals, the second with one pair of marginals, the third with a complete row; fourth segment with three irregular rows of strong bristles. Genitalia simple.

Holotype—♀, Orillia, Ont., June 5, 1925 (Curran), No. 2238 in the Canadian National Collection, Ottawa.

Compsilura Bouche.

Naturg. d. Insekt., i, 58, 1834.

Of this genus there are two species occurring in North America, separable as follows:

Dorso-centrals 3-3; cheeks one-fourth the eye-height. (Porto Rico, Jamaica).
..... *opugnator* Walton.

Dorso-centrals 3-4; cheeks almost one-third the eye-height (Northeastern States and Canada) *concinnata* Meigen.

Compsilura concinnata Meigen.

Tachina concinnata Meigen, Syst. Beschr., iv, 412, 824.

Specimens before me are from Fredericton, N.B., (J. D. Tothill), Melrose Highlands, Mass., and Europe. This is the chief Tachinid parasite of the Gypsy and Brown Tail moths. Its range in North America may be expected to extend gradually over most of the Nearctic region.

Compsilura opugnator Walton.

Proc. Ent. Soc. Wash., xvi, 93, 1914.

Originally described from Porto Rico. I have specimens before me from Jamaica. It is probable that the species will eventually be found in Southern Florida.

Allophorocera Hendel.

Verh. Zool. Bot. Ges., Wien, li, 203, 1901.

The type of this genus is *Dexodes auripila* B.B., a European species. There is but one North American species.

Allophorocera montana Smith.

Psyche, xxiv, 140, 1917.

Four males and five females from British Columbia, (E. R. Buckell, W. Downes, C. B. Garrett, R. C. Treherne, T. Wilson). The palpi are often brownish red or dark reddish.

BOOK NOTICE

Insects of Australia and New Zealand. By R. J. Tillyard. 560 pp. with 1251 figures. Published by Angus and Robertson, Limited, 89 Castlereagh St., Sydney, Australia. 1926.

In this book the author has presented a fairly elaborate account of the Insect fauna of Australia and New Zealand, being much more comprehensive than Froggatt's "Australian Insects" which treated only of the species occurring in Australia. The inclusion of the New Zealand species has made this work a valuable combination of Froggatt's book and G. V. Hudson's "Manual of New Zealand Entomology" and "New Zealand Moths and Butterflies." The present work is an improvement over its predecessors in that it brings up to date our knowledge of the insects of this region, and the adoption of the most recent system of classification with the addition of chapters on the Morphology, Life History, Distribution, Fossil History and Economics of the species treated also adds immensely to its value. It is designed primarily as a text-book for use by students of entomology in Australia and New Zealand, but should also meet with the approval of all those having a general interest in the Insect life of that region of the world.

There are thirty chapters included in the book, each of the twenty four orders of insects being treated in a separate chapter; the remaining chapters are devoted to Morphology, etc. Under each order discussed is a scheme of classification and key to the families of that order. Both the orders and families are clearly characterized and where important economic species occur a short description is included to ensure their recognition. The text is amply illustrated by 468 text figures most of which are original and are well executed and designed to illustrate the particular point in question, a feature often lacking when figures are borrowed from other publications. There are also 44 plates including 783 figures, 203 of which are in color. The author is to be commended on the excellent illustrations which he provides.

Throughout the book stress is given to the phylogenetic relationships of the groups and a considerable space is devoted to discussing some of the more primitive orders. Dr. Tillyard's remarks on phylogeny should prove very interesting to students of this phase of entomology.

The addition of a chapter on the collection and preservation of insects and a glossary of biological terms should be of special value to the beginner. The inclusion of the authority with all specific and sub-specific names is also to be commended. Dr. Tillyard is to be warmly congratulated on his excellent contribution to the science of entomology.

G. S. WALLEY.

